

Collectibility Analysis for Small and Medium Enterprise – Bank BUKOPIN Case

Deddy P. Koesrindartoto^{*1}, Mega Pratiwi¹

¹School of Business and Management, Institut Teknologi Bandung, Indonesia

ABSTRACT

In Indonesia, small and medium enterprises (SME) have experienced 68% growth in 2008 and 47% growth in 2007. The simple structure made it able to respond quickly to changing economic conditions and meet local customers' needs, growing sometimes into large and powerful corporations or failing within a short time of the firm's inception. Unfortunately, lack of access to finance has been cited as an important problem for SMEs, being the constraint in the creation, development or diversification of their economic activities. Lending institution such as banks conduct an intensive assessment (usually called credit scoring) to find out the creditworthiness of applicants in order to mitigate the risk. This paper, "Collectability Analysis in Small and Medium Enterprise", is purposed for creating appropriate credit scoring model to support the judgmental analysis approach in small and medium enterprise, finding out how generic and plafond-specific variables affect the collectability of the debtors from different plafond level (< Rp. 500 Million and > Rp. 500 Million), and providing early detector for the bank to predict about future loan performance of its debtors, thus the bank can be more careful in selecting qualified debtors.

Key words: small and medium enterprises, credit rating, loan plafond, collectability, generic variables, plafond-specific variables.

Introduction

Small and medium sized enterprises are reasonably considered as the backbone of the economy of many countries all over the world. In Indonesia, this business sector has experienced 68% growth in 2008 and 47% growth in 2007. The simple structure made it able to respond quickly to changing economic conditions and meet local customers' needs.

Lack of access to finance has been cited as an important problem for SMEs, being the constraint in the creation, development or diversification of their economic activities. If this difficult access to financing is not handled, the development of SMEs as one of the

economy backbone will be hampered since they cannot access sufficient long-term borrowing to allow them to modernize their operations, while they also lack of alternative non-bank financing sources. This lack of access to financing problem is due to SMEs high risk of inability to repay the loan, causing a fear of incurring bad debts for the banks. Lending institution such as banks conduct an intensive assessment (usually called credit scoring) to find out the creditworthiness of applicants in order to mitigate the risk.

Bank Bukopin as a financial institution that is really supportive to the development of SME through its loan program, has also already implemented a computerized system to

^{*}Correspondence author. Email: deddy@sbm-itb.ac.id

score the credit rating of its debtors using several variables which have been weighted by certain scoring proportion. The output of the system is somehow not representing the real credit score for the particular debtor due to the involvement of several judgmental (thus, subjective) valuation from the credit or account officer. The approved credits which were previously predicted to be good enough sometimes end with loss.

That is why, the writer feels that making the comparable formula with the right proportion of each variable to find out the creditworthiness of a debtor coming from small and medium enterprise might be important to prove whether the credit scoring system implemented by Bank Bukopin has been good or not in predicting the credit coll

In this research, there will be the scoring of SME loan exist and find out the formula or equation of creditworthiness level of the loan, influential factors which affect the collectability of a debtor and the weight or influencing level of each factor. The assessment to find the loan's credit collectability model will be done based on the loan plafond (low plafond or less than Rp. 500 Million and high plafond or greater than Rp. 500 Million).

Objectives

The result of this project is mainly expected to deliver great output of enabling qualified SMEs for getting access to fund through great assessment process. In detail, the project's purposes in detail are finding out how both generic variables and plafond-specific variables affect the collectability of the debtors, and providing early detector for the bank to predict about future loan performance of its debtor, thus the bank can be more careful in selecting qualified debtors. This model is hoped to help the bank reducing the number of non performing loan.

Scope and Limitation

This research is limited to the subject of small and medium enterprise (SME) credit only. The data proceed for explaining the relationship between debtors' personal and business characteristics with the collectability level of the loan are gathered from SME debtor's records of Bank Bukopin in all Bandung area. There are about 186 credit facilities in small and medium enterprises whose credit facility still exists between January 2009 and January 2010.

Theoretical Foundation

In this section, we will review the basic theory of credit scoring and collectability which is the main discussion in this research.

Definition of Credit

According to Law No. 7 Year 1992 on Banking, credit definition is: "the provision of money or bills are similar, based on the consent agreement between the bank lending by other parties, which requires the parties to borrow to pay off their debts after a certain period with the amount of interest, compensation or profit sharing".

Credit Scoring

Charles B. Wendel and Matthew Harvey define credit scoring as a statistical technique that combines several characteristics to form a single score to assess a borrower's creditworthiness. Since experience has shown a strong link between the payment behavior of the business owner and that of the business, SME credit scores usually include financial characteristics from both the business and the business owner.

Table 1. Loan collectability level

Loan Category	Definition
1 (pass)	debts that the borrower is able to pay the principal and interest for in a full and timely manner
2 (special-mention)	debts that the borrower is able to pay the principal and interest for in full but there exists a sign of decreasing payment ability
3 (substandard)	debts that the borrower is not able to pay the principal and interest for in a timely manner and some loss of principal and interest is possible
4 (doubtful)	debts in relation to which the loss of principal and interest is highly probable
5 (loss)	debts that are uncollectible

Credit scoring model is used to identify credit risks and mitigating factors, evaluating borrower viability and growth potential, assessing entrepreneurial capabilities, determining financing requirements and earnings for bank, monitoring loan performance risks in crisis situations, and structuring facilities based on credit score ratings.

Scoring systems utilize information relating to the traditional 5Cs of credit: (1) character (the willingness to repay debt), (2) capacity (the financial ability to repay debt), (3-4) capital and collateral (possessions or equities from which payment might be made), and (5) conditions (reflecting the general economic environment, or special conditions applying to the borrower of credit) (Savery 1977, Sparks 1979, Galitz 1983). However, those five main points will be divided more

into several sub variables by considering several factors covering business model, environment and industry, ideas and projects, market demand, business competition, business strategy, ownership and management, and financing.

Collectability

According to Siamat (2005:358): “Non-Performing Loan can be defined as a loan repayment difficulty as a result of deliberate action or due to external factors beyond control of the debtor”. The loan is usually classified by bank based on its collectability, or according to their inherent risks as “pass”, “special mention”, “substandard”, “doubtful”, and “loss”, which is primarily based on the period that payments of principal and interest are overdue.

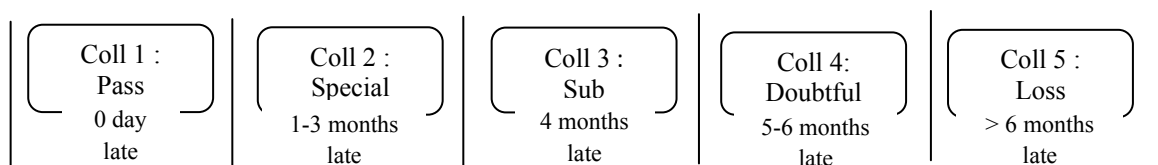


Figure 1. Collectability category

Methodology

This research will use multiple linear regression method for processing the data. This method is used to predict a single variable (collectability) from one or more independent variables. The prediction of Y is accomplished by the following equation:

$$y_i = \beta_0 + \beta_1 x_{1i} + \beta_2 x_{2i} + \dots + \beta_k x_{ki} \quad (\text{eq. 3.1.})$$

Where:

y : independent variable's result
 β_0 : the constant term

β_1 to e_{ke} : the coefficients relating the k explanatory variables to the variables of interest.

Since we involve several dummy variables due to the existence of so many judgmental assessments by account officer, the sample equation could be:

$$y_i = \beta_0 + \beta_1 x_{1i} + \delta_1 d_{1i} + \delta_2 d_{2i} + \dots + \beta_k x_{ki} \quad (\text{eq. 3.2.})$$

Just assume that the d_1 is assigned by 1 for those using the loan for working capital and other usage and assigned by 0 for investment, d_2 is set 1 for those using the loan for

investment and other usage and assigned 0 for working capital. The " β " values are called regression weights and while " x " is the variable occupied as the independent variable (financial ratio, historical credit performance, business prospects, etc) to determine the dependent variable (collectability).

Data Analysis

This part contains the explanation about variables that are evaluated in the research, the descriptive data of the samples, and analysis of SPSS outputs which become the core of the research findings.

Data Variables

There are two types of variables to be occupied in this analysis; generic variables and business/plafond specific-variables. Generic variables are the aspects which are evaluated for all plafond level and business categories, while business/plafond specific variables are the evaluated aspects which will vary between different loan plafond level and business categories. In this research, there will be two plafond categories which are high plafond (> Rp. 500 Million) and low plafond (< Rp. 500 Million).

Table 2. Generic variables occupied in the research

No	Variables	Description	Score			
1.	Collectability	Collectability level (1-5)				
2.	Period of loan facility	Number of years given for paying back the loan				
3.	Adjusted plafond	Plafond ratio per Rp 500 Million				
4.	Debt ratio	Debt / asset				
5.	Profitability ratio	Net income/ sales				
6.	Liquidity ratio	Current asset / current liability				
Credit Facility Analysis						
			Dummy variable 1	Z ₁₁	Z ₁₂	
7.	Usage type	1 good - ex : investment		0	1	
		2 fair – ex : working capital		1	0	
		3 weak – ex : others		1	1	
Collateral Sufficiency						
			Dummy variable 2	Z ₂₁	Z ₂₂	Z ₂₃
8.	Collateral type	collateral liquid : cash, saving, deposit		0	0	1
		1 account, etc				
		2 collateral solid I : Land and building		0	1	0
		3 collateral solid II : land		0	1	1
		non solid I : car, machinery, work				
		4 equipment		1	0	0
		5 non solid II : account receivable, inventory		1	0	1
		6 No collateral		1	1	0
Dummy variable 3						
9.	Strength of collateral claim	1 Acceptable		0		
		2 Not acceptable		1		
10.	Collateral coverage	The proportion of the collateral coverage over the loan plafond				
11.	Total liquid collateral	Percentage of liquid collateral relative the all proportion of collateral proposed				
Third Party Guarantee						
			Dummy variable 4	Z ₄	Z ₄₂	Z ₄₃
				1		
12.	Guarantor type	Guarantee from government without requirements		0	0	1
		1 Bank guarantee/company without pre requirement		0	1	0
		2 Credit insurance (ex : askrindo, jasindo) – 75% coverage		0	1	1

13.	Guarantee coverage	4	Other party guarantee (LoI/ VoC) / no guarantee The proportion of guarantee over the loan plafond	1	0	0
Legality and Documentation						
14.	Business legality	1	Good	Dummy variable 5	score	
		2	Acceptable		1	
		3	Weak		2	
15.	Debtor legality	1	Good	Dummy variable 6	3	
		2	Acceptable		1	
		3	Weak		2	
16.	Collateral legality	1	Good	Dummy variable 7	3	
		2	Acceptable		1	
		3	Weak		2	
Industry Type						
17.	Industry type			Dummy variable 8		
		Trade			0	
		Service			1	

Table 3. Plafond-specific variables for < Rp. 500 Million plafond

< Rp. 500 Million						
No	Variables		Description			Score
1.	Average monthly balance	1	Average monthly balance is increasing	<i>Dummy variable 9</i>		
		2	Average monthly balance is stable	1		
		3	Average monthly balance is decreasing	2		
2.	Account mutation activity	1	Mutation activity in credit side is more than 50% of total mutation	<i>Dummy variable 10</i>		
		2	Mutation activity in credit side is between 40 – 50%	1		
		3	Mutation activity in credit side is less than 40%	2		
3.	Experience/ competency	1	More than 2 years experience	<i>Dummy variable 11</i>		
		2	1-2 years experience	1		
		3	Less than 1 year experience	2		
4.	Reputation/ Integrity	1	Good reputation/positive opinion from work client	<i>Dummy variable 12</i>		
		2	Fair reputation/both positive and negative opinion from work client	1		
		3	Bad reputation/ negative opinion from work client	2		
5.	Loan experience with Bank Bukopin	1	Past performance during cooperation with Bank Bukopin was good	<i>Dummy variable 13</i>		
		2	Past performance during cooperation with Bank Bukopin was bad / there was an unpaid installment	1		
		3	No information	2		
6.	Loan experience with other Bank	1	Bank checking result is good : coll 1	<i>Dummy variable 14</i>		
		2	Bank checking result is fair : coll 2	1		
		3	Bank checking result is bad : coll 3,4,5 or no information	2		

Table 4. Plafond-specific variables for > Rp. 500 Million plafond

> Rp. 500 Million				
No	Variables		Description	Score
Dummy variable 15				
1.	Financial information quality	1	Very good quality, strong audit	1
		2	Acceptable quality, audited	2
		3	Low/unacceptable quality, not audited	3
Dummy variable 16				
2.	Average monthly balance	1	Good, it increases	1
		2	Fair, it is stable	2
		3	Low, it decreases	3
Dummy variable 17				
3.	Account mutation activity	1	Good, high turnover	1
		2	Fair, stable turnover	2
		3	Bad, low turnover	3
Dummy variable 18				
4.	Experience / competency	1	High experience and competent (> 15 years) in relevant business	1
		2	High experience and competent (10 - 15 years) , good business performance	2
		3	Unacceptable experience and competency (5-10 years)	3
		4	Very limited experience and competency (2-5 years)	4
		5	No experience and competency (< 2 years)	5
Dummy variable 19				
5.	Reputation / Integrity	1	Very good reputation (during last 5 years)	1
		2	Good reputation, there was negative signal but not significant (during last 3 years)	2
		3	Acceptable – small negative sign (last 2 years)	3
		4	Weak – 1 big conflict (last 2 years)	4
		5	Very weak – several big conflicts (<2 years)	5
Dummy variable 20				
6.	Credit experience	1	Good – never have unpaid loan installment	1
		2	Fair – some unpaid loan installment	2
		3	Low – often have unpaid loan installment	3
Dummy variable 21				
7.	Business prospect	1	Good – business will grow	1
		2	Fair – business is stable	2
		3	Low – business is decline	3
Dummy variable 22				
8.	Social politic factor	1	No social & politic problem	1
		2	Insignificant social & politic problem to industry	2
		3	Acceptable social & politic problem	3
		4	High social and politic problem, which is significant to the industry	4
		5	Very influential social and politic problem to industry	5
Dummy variable 23				
9.	Foreign currency exposure	1	No exposure to foreign currency	1
		2	Company has little exposure on foreign currency (natural hedge/100% hedging)	2
		3	Some exposures to foreign currency (> 75% hedging)	3
		4	Some exposures to foreign currency (< 75% hedging)	4
		5	High exposure to foreign currency (no hedging)	5
Dummy variable 24				
10.	Market share	1	Very dominant - > 50%	1
		2	Strong – 40-50%	2
		3	Fair – 20-40%	3

		4	Weak – 10-20%		4	
		5	Very weak - < 10%		5	
				<i>Dummy variable 25</i>		
11.	Supplier concentration	1	Very low dependency to supplier, many suppliers		1	
		2	Low dependency to supplier		2	
		3	Fair dependency to supplier		3	
		4	High dependency to supplier		4	
		5	Very high dependency to supplier		5	
				<i>Dummy variable 26</i>	Z_{261}	Z_{262}
12.	Marketing coverage	1	National		0	1
		2	Province		1	0
		3	Regency (Kabupaten)		1	1

The variables grouping into generic variables and plafond-specific variables then rises the curiosity on what is more influential to predict loan collectability level. That's why this research tries to find 5 loan collectability models; 3 models evaluate generic variables only and the other 2 models evaluate both generic and plafond-specific variables. The 5 models are:

1. General collectability model (generic variables only)
 - a) for all plafond level
 - b) plafond level < Rp. 500 Million
 - c) plafond level > Rp. 500 Million
2. Collectability model for plafond level less than Rp. 500 Million (generic and plafond-specific variables)
3. Collectability model for plafond level greater than Rp. 500 Million (generic and plafond-specific variables).

Data Collection

In this part, I am going to explain about sample's composition in the question which contains interval answer and those that are categorized in general model only.

Loan Plafond Category

The debtors mostly propose for low plafond level which is < Rp. 500 Million, represented by 66.13%. The next biggest proportion is moderate plafond level (Rp. 500 Million – Rp. 2.5 Billion) with 25.8% proportion.

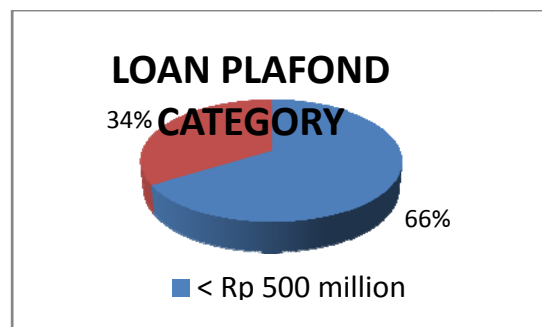


Figure 2. Debtors' composition: loan plafond category

Collectability Level

From the composition of coll status of all debtors, 68.28% debtors are having good loan performance, with routine and on time payment.

There are only 12% unperformed loans around all debtors (coll 3-4-5). This proportion is actually quite significantly different one to another (between performing and non performing loan).

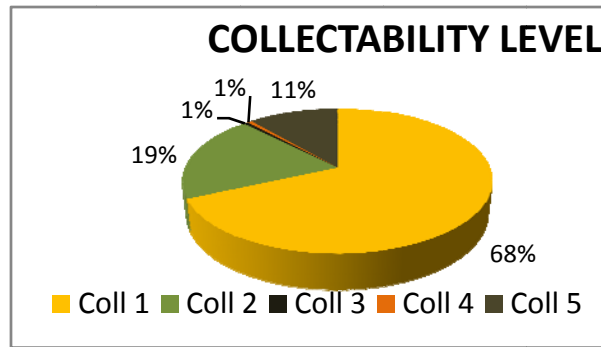


Figure 3. Debtors' composition: collectability level

Data Analysis

General loan collectability model (generic variables only)

In general model, there are four models generated but only one model should be chosen based on several factors which are the possession of high R square, logical reasoning behind the

taken variables, and economically cheap. So, the chosen model is last model with highest coefficient of determination (R square: 0.127) although the ability of the independent variables to predict the collectability is still very low. The value of R-Square indicates that only 12.7% of the variance in loan collectability level can be predicted from those independent generic-variables.

Table 5. Model summary of general collectability model

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.236 ^a	.055	.050	1.24547
2	.301 ^b	.091	.081	1.22527
3	.334 ^c	.112	.097	1.21448
4	.357 ^d	.127	.108	1.20710

- Predictors: (Constant), profitability, ratio
- Predictors: (Constant), profitability, ratio, collateral, coverage
- Predictors: (Constant), profitability, ratio collateral, coverage, z41_guarantor, type
- Predictors: (Constant), profitability, ratio collateral, coverage, z41_guarantor, type, liquid, collateral

It reflects that so many more factors influencing collectability level should be taken into account to increase the R-square value, reflecting that the variables we occupy are not strong and complete enough. Since for this analysis we only occupy generic variables

(which are used by all business categories with all plafond level), so adding the business-specific variables that haven't been included yet (structure and quality of management and business) might be useful to better predict the loan collectability level.

Table 6. Coefficient table of general collectability model

Model	Unstandardized		Standardized	t	Sig.
	B	Std. Error	Beta		
1 (Constant),profitability,ratio	2.215	.188		11.759	.000
	-2727	.832	-.236	-3.278	.001
2 (Constant), profitability,ratio,	2.088	.191		10.910	.000
collateral, coverage	-2.688	.818	-.232	-3.284	.001
	.081	.031	.188	2.662	.008
3 (Constant), profitability,ratio	1.831	.227		8.060	.000
collateral, coverage,	-2.467	.818	-.213	-3.016	.003
z41_guarantor,type	.082	.030	.190	2.710	.007
	.375	.182	.146	2.061	.041
4 (Constant), profitability,ratio	1.872	.227		8.250	.000
collateral, coverage,	-2.606	.817	-.225	-3.190	.002
z41_guarantor,type, liquid,	.082	.030	.190	2.724	.007
collateral	.407	.182	.158	2.243	.026
	-.653	.364	-.126	-1.795	.074

a. Dependent Variable: collectability

B variable shows the values for the regression equation for predicting the dependent variable from the independent variable. The complete equation:

$$\text{Loan collectability} = 1.872 - 2.606 \text{ profitability ratio} + 0.082 \text{ collateral coverage} + 0.407 \text{ z}_{41} \text{ guarantor type} - 0.653 \text{ liquid collateral}$$

Analysis of each factor's coefficient:

- a) Profitability ratio – the coefficient (parameter estimate) is -2.606. So, when the profitability ratio is 100%, there will be 2.606 point decrease in debtor's collectability level which reflects better loan performance, holding all other variables constant. In other word, the bigger the profitability ratio, the better loan performance will be.
- b) Collateral coverage – the coefficient (parameter estimate) is 0.082. So, for 100% collateral coverage, there will be 0.082 point increase in debtor's collectability level which reflects worse loan performance, holding all other variables are constant. The bigger the collateral coverage, the bigger the collectability level or less perform the loan will be. It is relevant since when a debtor has a large coverage of collateral relative to the loan plafond, their responsibility to fulfill the payment obligation is lower. They have a tough that they have

provided a guarantee in the form of asset that is valued higher than the loan plafond itself.

- c) Z₄₁_guarantor type – the coefficient (parameter estimate) is 0.407. So, there will be 0.407 point increase in debtor's collectability level in the condition when there is no guarantee for the loan from formal parties (government/ bank/ credit insurance) which reflects worst loan performance (late payment or uncollectible) holding all other variables constant. It might be caused by higher risk of unpaid loan due to inexistence of guarantee.
- d) Total liquid collateral (X6) - the coefficient (parameter estimate) is - 0.653. It shows that if the 100% of the collateral are liquid asset, the collectability level will be improved as many as 0.653. It is related to the form of granted assets that are easily liquidated then lower the risk of unpaid loan.

General model for < Rp. 500 Million loan plafond (generic variables only)

The table shows that the highest correlation between the observed and predicted values of this research's dependent variable is in model 3 which result 0.386 (shown by R). In addition, the coefficient of determination (*R-Square*) shows that proportion of variance in the dependent variable (collectability level) of loan generally (for less than Rp. 500 Million loan plafond) which can be predicted from the independent variables is 0.149. This value indicates that only 14.9% of the variance in

loan collectability level can be predicted from those independent variables.

Since for this analysis we only occupy generic variables which are used by all business categories with all plafond level), so adding the business-specific variables (financial information quality, structure & quality of management and business) that haven't been included yet might be useful to better predict the loan collectability level. This coefficient of determination number is not significantly different with the adjusted R-square value (12.7%) that attempts to yield a more honest value to estimate the R-squared for the sample.

Table 7. Model summary of general collectability model of low plafond level

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.300 ^a	.090	.082	1.00216
2	.347 ^b	.120	.106	.98935
3	.386 ^c	.149	.127	.97722

a. Predictors: (Constant), collateral, coverage
b. Predictors: (Constant), collateral, coverage, ratio,
c. Predictors: (Constant), collateral, coverage, liquidity,ratio, industry ,type

Table 8 Coefficient table of general collectability model of low plafond level

Model	Unstandardized		Standardized	t	Sig.
	B	Std. Error	Beta		
1 (Constant), collateral, coverage	1.340	.099		13.562	.000
	.087	.025	.300	3.443	.001
2 (Constant), collateral, coverage, ratio	1.257	.106		11.877	.000
	.086	.025	.296	3.444	.001
	.015	.008	.175	2.032	.044
3 (Constant), collateral, coverage, liquidity,ratio, industry ,type	1.129	.123		9.195	.000
	.085	.025	-.295	3.478	.001
	.015	.007	.172	2.020	.046
	.369	.185	.19	1.993	.049

a. Dependent Variable: collectability

B variable shows the values for the regression equation for predicting the dependent variable

from the independent variable. The complete equation:

Loan collectability (low plafond level)

$$= 1.129 + 0.085 \text{ collateral coverage} + 0.015 \text{ liquidity ratio} + 0.369 \text{ industry type}$$

From the above equation, it can be known that at the time of no collateral coverage, zero liquidity ratio, and trade based-industry, the loan coll status is 1.129.

Analysis of each factor's coefficient:

a) Collateral coverage – the coefficient (parameter estimate) is 0.085. So, when there is greater coverage of collateral in regard to the loan plafond, there will be

0.085 point increase in debtor's coll level which reflects worse low plafond loan performance, holding all other variables constant. In summary, we can say that bigger collateral coverage will usually result in bigger coll level or less collectable loan. It might be caused by the tendency of less responsible debtor when they have granted a large coverage of asset as the collateral for their loan.

- b) Liquidity ratio - the coefficient (parameter estimate) is 0.015. So, when there is higher proportion of current asset rather than the current liability, there will be 0.026 times of the proportion point increase also in loan coll level which reflect worse loan collectability. Although this result contradicts with the common assumption of credit analyst which assign higher value on higher liquidity ratio, there is a possible reasoning behind this. Company with low current asset (lower liquidity ratio) will put more value on 'money or loan' given by the bank since their current asset is limited. That's why, considering the importance of the loan for them, they will be more responsible and carefull in maintaining their performance and reputation in front of the bank.

- c) Industry type - the coefficient (parameter estimate) is 0.369. So, when the business type is related with service industry, there will be 0.369 point increase also in loan coll level which reflect worse loan collectability.

General model for > Rp. 500 Million loan plafond (generic variables only)

Model 2 is shown to be the one having the highest correlation between the observed and predicted values of this research's dependent variable, with R value of 0.426. In addition, the coefficient of determination (R-Square) shows that proportion of variance in the dependent variable (collectability level) of loan with greater than Rp 500 Million plafond which can be predicted from the independent variables is 0.181. This value indicates that only 18.1% of the variance in loan collectability level can be predicted from those independent variables.

This result reflects that many more factors influencing collectability level should be taken into account, which later will be called business/plafond-specific variables. This number of R-square is not significantly different with the adjusted R-square value (15.4%) which is an adjustment of the R-squared that penalizes the addition of extraneous predictors to the model.

Table 9. Model summary of general collectability model of high plafond level

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.328 ^a	.108	.093	1.49966
2	.426 ^b	.181	.154	1.44852

a. Predictors: (Constant), industry, type

b. Predictors: (Constant), industry, type, liquidity, rate

Table 10. Coefficient table of general

Model	Unstandardized		Standardized	t	Sig.
	B	Std. Error	Beta		
1 (Constant), industry, type	2.439	.234		10.414	.000
	-1.075	.396	.328	-2.713	.009
2 (Constant), industry, type, liquidity, ratio	2.692	.251		10.718	.000
	-1.023	.383	-.312	-2.667	.010
	-.060	.026	-.272	-2.320	.024

a. Dependent Variable: collectability

Collectability model of high plafond level B variable shows the values for the regression equation for predicting the dependent variable from the independent variable. The complete equation: *Loan collectability (for high plafond*

loan) = $2.692 - 1.023 \text{ industry type} - 0.060 \text{ liquidity ratio}$ From the above equation, it can be known that at the time of the business type is in trade industry with zero liquidity ratios, the loan coll status is 2.692.

Analysis of each factor's coefficient:

a) Industry type - the coefficient (parameter estimate) is -1.023. So, when the business type is related with service industry (valued by 1), there will be 1.023 point decrease also in loan coll level which reflects better loan collectability. In short, businesses which have high loan plafond and work in service industry tend to have better loan performance than those which come from trade industry.

b) Liquidity ratio – the coefficient (parameter estimate) is -0.060. So, when there is greater liquidity ratio, there will be 0.060 point decrease relative to the percentage increase of liquidity ratio in debtor's coll level. It reflects better high plafond loan performance, holding all other variables constant. This finding states that the bigger the liquidity ratio, the greater company's ability to meet the loan obligation because they have large proportion of asset compared to the liability.

Collectability model for low loan plafond, less than Rp. 500 Million (generic and business / plafond-specific variables)

For low plafond level category, the ability of the independent variables to predict the collectability is a little bit higher than the general model but it's still low and insufficient

for predicting the collectability. The main reason behind this is the limited amount of sample of each business category that causes the model creation for each business type is impossible to make. That's why the model just occupies the variables that each business assesses, with so many more business-related variables can't be involved in the analysis.

Table 11. Model summary of low loan plafond collectability model

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.300 ^a	.090	.082	1.00216
2	.347 ^b	.120	.106	.98935
3	.389 ^c	.151	.130	.97602
4	.416 ^d	.173	.145	.96723

a. Predictors: (Constant), collateral, coverage

b. Predictors:(Constant),collateral,coverage, liquidity,ratio

c. Predictors:(Constant), collateral, coverage, liquidity,ratio, reputation, integrity

d. Predictors: (Constant), collateral, coverage, liquidity,ratio, reputation, integrity, industry.type

The table presents that the highest correlation between the observed and predicted values of this research's dependent variable is

in model 4 which result 0.416 (shown by R). In addition, the coefficient of determination (R-Square) shows that proportion of variance in

the dependent variable (collectability level) of loan generally which can be predicted from the independent variables is 0.173. This value shows that the model can only predict 17.3% of the variance in loan collectability level from

those independent generic-variables. It reflects that other specific factors influencing collectability level should have been assessed also to increase the R-square value, reflecting that the variables we occupy are still weak.

Table 12. Coefficient table of low loan plafond level collectability model

Model	Unstandardized		Standardized	t	Sig.
	B	Std. Error	Beta		
1 (Constant), collateral, coverage	1.340	.099		13.562	.000
	.087	.025	.300	3.443	.001
2 (Constant), collateral, coverage, liquidity, ratio	1.257	.106		11.877	.000
	.086	.025	-.296	3.443	.001
	.015	.008	.175	2.032	.044
3 (Constant), collateral, coverage, liquidity, ratio, reputation, integrity	2.887	.795		3.630	.000
	.086	.025	-.299	3.528	.001
	.0124	.009	.274	2.809	.006
	-1.652	.799	-.201	-2.067	.041
4 (Constant), collateral, coverage, liquidity, ratio, reputation, integrity, industry, type	2.605	.804		3.240	.002
	.086	.024	.298	3.548	.001
	.023	.009	.261	2.693	.008
	-1.482	.798	-.181	-1.858	.066
	.328	.185	.150	-1.776	.078

a. Dependent Variable: collectability

B variable shows the values for the regression equation for predicting the dependent variable from the independent variable. The complete equation: **Loan collectability** = 2.605 + 0.086 collateral. coverage + 0.023 liquidity ratio – 1.482 reputation/integrity + 0.328 industry type

Analysis of each factor's coefficient:

- a) Collateral coverage – the coefficient (parameter estimate) is 0.086. So, for 100% collateral coverage, there will be 0.086 point increase in debtor's collectability level which detect worse loan performance, holding all other variables constant. It can happen since when a debtor has a large coverage of collateral relative to the loan plafond, their responsibility to fulfill the payment obligation is lower. They have a thought that they have provided a guarantee in the form of asset that is valued higher than the loan plafond itself.
- b) Liquidity ratio – the coefficient (parameter estimate) is 0.023. So, when the current asset is as big as the current liability, the collectability level will experience 0.023 point increase. The bigger the current asset relative to the current liability, the bigger

coll level also will be, representing worse loan performance. That is because company with low current asset (lower liquidity ratio) will put more value on 'money or loan' given by the bank since their current asset is limited. That is why, considering the importance of the loan for them, they will be more responsible and carefull in maintaining their performance and reputation in front of the bank.

- c) Reputation/ integrity – the coefficient - 1.482 indicates that company with worse reputation usually has better loan performance, especially in term of collectability. It might be related with the fact that business with worse reputation will try and give more effort to improve their reputation by meeting its payment obligation since it considers the importance of improving reputation for raising creditor's confidence and trust.
- d) Industry type – the coefficient + 0.328 reflects that a debtor with service-based business will have 0.328 point higher in coll level, indicating that the loan is less collectable than those who have trade-based business. This might be due to more volatile and risky of service-based business.

Model for high loan plafond, greater than Rp. 500 Million (generic and business / plafond-specific variables)

Table 13. Model summary of high loan plafond collectability model

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.446 ^a	.199	.186	1.42107
2	.628 ^b	.395	.375	1.24511
3	.695 ^c	.483	.456	1.16121
4	.740 ^d	.548	.517	1.09480
5	.763 ^e	.582	.545	1.06164
6	.795 ^f	.632	.593	1.00477
7	.821 ^g	.674	.633	.95406
8	.838 ^h	.703	.659	.92005
9	.853 ⁱ	.728	.682	.88757
10	.865 ^j	.749	.700	.86227
11	.879 ^k	.772	.723	.82891
12	.886 ^l	.785	.733	.81296
13	.885 ^m	.782	.735	.80998
14	.895 ⁿ	.800	.752	.78390

a. Predictors: (Constant), z262_marketing.coverage

b. Predictors: (Constant), z262_marketing.coverage, industry.type

c. Predictors: (Constant), z262_marketing.coverage, industry.type, experience.competence

d. Predictors: (Constant), z262_marketing.coverage, industry.type, experience.competence, account.mutation.activity

e. Predictors: (Constant), z262_marketing.coverage, industry.type, experience.competence, account.mutation.activity, liquidity.ratio

f. Predictors: (Constant), z262_marketing.coverage, industry.type, experience.competence, account.mutation.activity, liquidity.ratio, market.share

g. Predictors: (Constant), z262_marketing.coverage, industry.type, experience.competence, account.mutation.activity, liquidity.ratio, market.share, reputation.integrity

h. Predictors: (Constant), z262_marketing.coverage, industry.type, experience.competence, account.mutation.activity, liquidity.ratio, market.share, reputation.integrity, supplier.concentration

i. Predictors: (Constant), z262_marketing.coverage, industry.type, experience.competence, account.mutation.activity, liquidity.ratio, market.share, reputation.integrity, supplier.concentration, foreign.exchange.exposure

j. Predictors: (Constant), z262_marketing.coverage, industry.type, experience.competence, account.mutation.activity, liquidity.ratio, market.share, reputation.integrity, supplier.concentration, foreign.exchange.exposure, business.prospect

k. Predictors: (Constant), z262_marketing.coverage, industry.type, experience.competence, account.mutation.activity, liquidity.ratio, market.share, reputation.integrity, supplier.concentration, foreign.exchange.exposure, business.prospect, politic.social.factor

l. Predictors: (Constant), z262_marketing.coverage, industry.type, experience.competence, account.mutation.activity, liquidity.ratio, market.share, reputation.integrity, supplier.concentration, foreign.exchange.exposure, business.prospect, politic.social.factor, z261_marketing.coverage

m. Predictors: (Constant), industry.type, experience.competence, account.mutation.activity, liquidity.ratio, market.share, reputation.integrity, supplier.concentration, foreign.exchange.exposure, business.prospect, politic.social.factor, z261_marketing.coverage

n. Predictors: (Constant), industry.type, experience.competence, account.mutation.activity, liquidity.ratio, market.share, reputation.integrity, supplier.concentration, foreign.exchange.exposure, business.prospect, politic.social.factor, z261_marketing.coverage, loan.period

In addition, the coefficient of determination (R-Square) shows that proportion of variance in the dependent variable (collectability level) of high plafond loan that is able to be predicted by the independent variables is 0.800. This value shows that the model can highly predict the variance in loan collectability level as many as 80% by using the occupied independent generic-variables. It reflects that the model has been strong and powerful enough to detect the possible future nonperforming loan from the debtor's loan application.

Table 14. Coefficient table of high loan plafond level collectability model

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.259	.273		4.605	.000
	z262_marketing.coverage	1.407	.362	.446	3.890	.000
2	(Constant)	1.591	.251		6.334	.000
	z262_marketing.coverage	1.739	.326	.551	5.338	.000
	industry.type	-1.492	.338	-.465	-4.411	.000
3	(Constant)	2.470	.364		6.790	.000
	z262_marketing.coverage	1.937	.310	.614	6.244	.000
	industry.type	-1.231	.326	-.376	-3.777	.000
	experience.competence	-.589	.186	-.316	-3.160	.002
4	(Constant)	1.393	.506		2.752	.008
	z262_marketing.coverage	1.713	.303	.543	5.660	.000
	industry.type	-1.194	.308	-.364	-3.881	.000
	experience.competence	-.569	.176	-.306	-3.237	.002
	account.mutation.activity	.623	.215	.264	2.894	.005
5	(Constant)	1.655	.506		3.274	.002
	z262_marketing.coverage	1.628	.296	.516	5.498	.000
	industry.type	-1.134	.300	-.346	-3.784	.000
	experience.competence	-.576	.171	-.309	-3.376	.001
	account.mutation.activity	.604	.209	.256	2.893	.005
	liquidity.ratio	-.042	.019	-.188	-2.163	.035
6	(Constant)	2.724	.615		4.427	.000
	z262_marketing.coverage	1.572	.281	.498	5.594	.000
	industry.type	-1.187	.284	-.362	-4.175	.000
	experience.competence	-.700	.168	-.376	-4.179	.000
	account.mutation.activity	.827	.214	.351	3.875	.000
	liquidity.ratio	-.064	.020	-.288	-3.206	.002
	market.share	-.515	.186	-.275	-2.763	.008
7	(Constant)	1.968	.650		3.029	.004
	z262_marketing.coverage	1.601	.267	.507	5.995	.000
	industry.type	-1.150	.270	-.351	-4.257	.000
	experience.competence	-.853	.169	-.459	-5.045	.000
	account.mutation.activity	.969	.210	.411	4.622	.000
	liquidity.ratio	-.087	.021	-.394	-4.185	.000
	market.share	-.621	.181	-.331	-3.426	.001
	reputation.integrity	.862	.323	.240	2.667	.010
8	(Constant)	2.101	.629		3.340	.002
	z262_marketing.coverage	1.616	.258	.512	6.275	.000
	industry.type	-1.035	.265	-.316	-3.900	.000
	experience.competence	-.898	.164	-.482	-5.464	.000
	account.mutation.activity	1.038	.204	.441	5.078	.000
	liquidity.ratio	-.084	.020	-.379	-4.169	.000
	market.share	-.673	.176	-.359	-3.814	.000
	reputation.integrity	1.129	.333	.314	3.387	.001
	supplier.concentration	-.301	.133	-.190	-2.267	.027
9	(Constant)	2.867	.696		4.116	.000
	z262_marketing.coverage	1.716	.252	.543	6.798	.000
	industry.type	-.907	.262	-.277	-3.456	.001
	experience.competence	-.952	.160	-.512	-5.939	.000
	account.mutation.activity	1.064	.197	.452	5.387	.000
	liquidity.ratio	-.091	.020	-.408	-4.600	.000
	market.share	-.751	.174	-.401	-4.324	.000
	reputation.integrity	1.086	.322	.303	3.376	.001
	supplier.concentration	-.342	.129	-.216	-2.640	.011
	foreign.exchange.exposure	-.401	.179	-.177	-2.242	.029
10	(Constant)	2.498	.700		3.567	.001
	z262_marketing.coverage	1.499	.267	.475	5.610	.000
	industry.type	-.928	.255	-.283	-3.636	.001
	experience.competence	-.968	.156	-.520	-6.207	.000
	account.mutation.activity	.935	.202	.397	4.631	.000
	liquidity.ratio	-.086	.019	-.389	-4.486	.000
	market.share	-.719	.169	-.383	-4.242	.000
	reputation.integrity	.995	.316	.277	3.152	.003
	supplier.concentration	-.397	.129	-.251	-3.088	.003
	foreign.exchange.exposure	-.357	.175	-.158	-2.041	.046
	business.prospect	.675	.331	.180	2.039	.047
11	(Constant)	2.031	.703		2.888	.006
	z262_marketing.coverage	1.524	.257	.483	5.926	.000
	industry.type	-.920	.245	-.281	-3.749	.000
	experience.competence	-.681	.195	-.366	-3.488	.001
	account.mutation.activity	.999	.196	.424	5.095	.000
	liquidity.ratio	-.082	.019	-.368	-4.387	.000
	market.share	-.596	.172	-.318	-3.476	.001
	reputation.integrity	.904	.306	.252	2.952	.005
	supplier.concentration	-.315	.129	-.199	-2.444	.018
	foreign.exchange.exposure	-.428	.171	-.189	-2.500	.016
	business.prospect	1.083	.365	.288	2.971	.005
	politic.social.factor	-.634	.276	-.277	-2.295	.026
12	(Constant)	3.258	.987		3.301	.002
	z262_marketing.coverage	.505	.638	.160	.792	.432
	industry.type	-.973	.243	-.297	-4.011	.000
	experience.competence	-.712	.192	-.383	-3.702	.001
	account.mutation.activity	1.059	.195	.450	5.420	.000
	liquidity.ratio	-.086	.018	-.385	-4.653	.000
	market.share	-.649	.171	-.346	-3.797	.000
	reputation.integrity	.898	.300	.250	2.991	.004
	supplier.concentration	-.314	.126	-.199	-2.488	.016
	foreign.exchange.exposure	-.468	.169	-.206	-2.761	.008
	business.prospect	1.099	.358	.292	3.072	.003
	politic.social.factor	-.643	.271	-.281	-2.372	.022
	z261_marketing.coverage	-1.086	.625	-.347	-1.738	.088
13	(Constant)	3.747	.768		4.880	.000
	industry.type	-.988	.241	-.301	-4.100	.000
	experience.competence	-.719	.191	-.386	-3.756	.000
	account.mutation.activity	1.088	.191	.462	5.683	.000
	liquidity.ratio	-.087	.018	-.394	-4.816	.000
	market.share	-.671	.168	-.358	-3.993	.000
	reputation.integrity	.888	.299	.247	2.971	.005
	supplier.concentration	-.316	.126	-.200	-2.512	.015
	foreign.exchange.exposure	-.473	.169	-.209	-2.806	.007
	business.prospect	1.142	.352	.304	3.242	.002
	politic.social.factor	-.643	.270	-.281	-2.381	.021
	z261_marketing.coverage	-1.541	.246	-.492	-6.260	.000
14	(Constant)	4.122	.764		5.395	.000
	industry.type	-1.002	.233	-.306	-4.296	.000
	experience.competence	-.723	.185	-.388	-3.900	.000
	account.mutation.activity	1.185	.191	.503	6.208	.000
	liquidity.ratio	-.085	.018	-.384	-4.848	.000
	market.share	-.717	.164	-.382	-4.368	.000
	reputation.integrity	.859	.290	.239	2.966	.005
	supplier.concentration	-.260	.125	-.164	-2.084	.042
	foreign.exchange.exposure	-.493	.163	-.218	-3.018	.004
	business.prospect	1.054	.343	.280	3.068	.003
	politic.social.factor	-.690	.262	-.302	-2.630	.011
	z261_marketing.coverage	-1.627	.242	-.519	-6.732	.000
	loan.period	-.121	.057	-.145	-2.109	.040

a. Dependent Variable: collectability

B variable shows the values for the regression equation for predicting the dependent variable from the independent variable. The complete equation:

Loan collectability = 4.112 – 1.002 Industry type – 0.723 experience/ competence + 1.185 account mutation activity – 0.085 liquidity ratio – 0.717 market share + 0.859 reputation/ integrity – 0.260 supplier concentration – 0.493 foreign exchange exposure + 1.054 business prospect – 0.690 politic and social factors – 1.627 z261_marketing coverage – 0.121 loan period.

Analysis of each factor's coefficient:

- a) Industry type - the coefficient (parameter estimate) is -1.002. It indicates that the service-based industry will get 1.002 lower points in its coll status, indicating the tendency of better loan performance compared to those coming from trade-based industry.
- b) Experience / competency - the coefficient (parameter estimate) is - 0.723. This result is somehow contradicting with the general assumption that debtors with less experience will not perform well in loan facility they receive. It happens because businesses with less experience (new entry) are usually more careful in maintaining their performance and reputation.
- c) Account mutation activity - the coefficient (parameter estimate) is 1.185. This coefficient means that as the account mutation activity in credit side is lower, there will be a greater increase in coll level which represents worse loan collectability.
- d) Liquidity ratio - the coefficient (parameter estimate) is -0.085. The result is rational since as the company has bigger liquidity ratio or current asset relative to the current liability, the more able it is in fulfilling the loan payment obligation.
- e) Market share - the coefficient (parameter estimate) is -0.717. As the market share is lower, this coefficient will be larger or the debt is proven to be more easily collectible. Business with low market share may prefer to target niche market which is proportionally small in size, and it makes the business to be more focus in running the business, exposed with lower risk and network effect.
- f) Reputation/ integrity - the coefficient (parameter estimate) is + 0.859. So, a debtor with very good reputation during the last 5 years will get 0.859 higher points in its coll level. It will be higher as the reputation level getting worse value, or in other word the coll level will be higher as the debtor's reputation and integrity is worse.
- g) Supplier concentration - the coefficient (parameter estimate) is -0.260. This coefficient indicates that when the debtors' dependency on their supplier is higher because they only have limited suppliers, the coll level will be lower. Business with limited supplier could lead to a loyalty, the tendency to well maintain the relationship and cooperation. Then this higher willingness to maintain the relationship with important party in their business is also seen in how they perform in front of the bank, in fulfilling their duty.
- h) Foreign currency exposure - the coefficient (parameter estimate) is - 0.493. It indicates that a business with high exposure to foreign currency fluctuation will perform better by having much lower point in its coll level. International scale business might more consider how important the bank's role in facilitating fund for running their large scale business, so they try to really manage their well performance in meeting their obligation to the bank.
- i) Business prospect - the coefficient (parameter estimate) is 1.054. This finding aligns with the credit analyst's belief that business with good business prospect and is expected to grow in the future will have better loan performance.
- j) Social and politic factors - the coefficient (parameter estimate) is 0.690. The result shows that a business with higher exposure to significant social & politic problem usually perform worse than those with less exposure to social & politic problem.
- k) z261_marketing coverage - the coefficient (parameter estimate) is - 1.627. So, business with smaller coverage (province or regency) will have better loan performance than the business with national scale coverage because it is exposed with lower risk and network effect.
- l) Loan period - this coefficient (-0.121) means that the coll level will reduce by 0.121 each year. In other words, the longer period given for the loan to be paid, the better collectability performance of that loan because the debtor is given more time to return the money.

Model Result Compared to Real Collectability

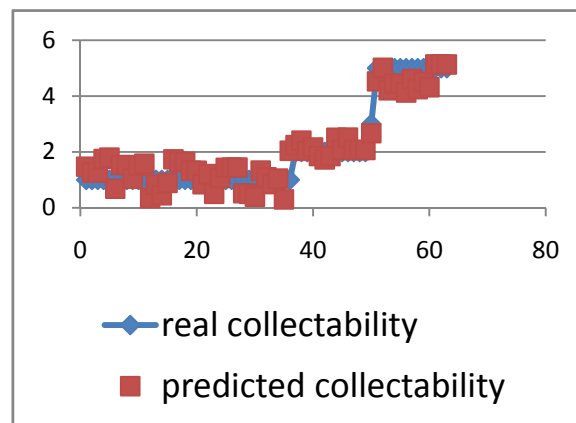


Figure 4. Real collectability vs. predicted collectability

Conclusion

From all of the above analysis, there are several conclusions drawn. First, the collectability prediction will be useful to help reducing non performing loan by the existence of early detector. Along with other analysis tools, collectability model is used as the alert to push the credit committee doing more careful loan approval and monitoring.

Second, generic variable used by Bank Bukopin to assess the loan proposed by the debtor is not that influential compared to the specific variables to assess the debtor credibility. It is proven by R square of the first three models which evaluate only generic variables are less than 20%.

Limitation and Further Research

This research is limited to the subject of small and medium enterprise (SME) credit only. The data proceed for explaining the

relationship between debtors' personal and business characteristics with the collectability level of the loan are gathered from SME debtor's records of Bank Bukopin in all Bandung area. There are about 186 credit facilities in small and medium enterprises whose credit facility still exists between January 2009 and January 2010.

As the recommendation, based on the above analysis, I propose for *the consideration of many more business-specific variables into the model*. From the model result, it is seen that the contribution of generic variables is only around 10-20% in predicting collectability level of small and medium enterprise's loan. It means that Bank Bukopin should put more focus on business-specific variables which were proven to be more influential. However, since the R-square in valid model (for high loan plafond) is still 80%, Bank Bukopin should consider other more variables that have not been included yet before.

References

Access Finance. (2006). SME Credit Scoring: Key Initiatives, Opportunities, and Issues, March [pdf]. Available at: <http://www.ficinc.com/Scanned%20Articles/2006-03%20AccessFinance%20%20SME%20Credit%20Scoring.pdf> [Accessed 30 January 2010].

Altman, E. & Sabato, G. (2005). Modeling Credit Risk for SMEs: Evidence from the US Market, Social Science Research Network, [online] 26 December. Available at: <http://papers.ssrn.com/sol3/papers.cfm?abstract_id=872336> [Accessed 5 February 2010].

Bank Bukopin, (2009). *Kebijakan Perkreditan Bank Bukopin*, [unpublished document].

Microfinance Risk Management, L.L.C. (2008). The Potential for Credit Scoring for SME Lending in Kenya, October [pdf]. Available at: <http://www.fsdkenya.org/pdf_documents/FS_D_Credit_Scoring_for_SME_lending.pdf> [Accessed 2 February 2010].

Resti, Andrea & Sironi, Andrea. (2007). *Risk Management and Shareholders' Value in Banking*: 377. England: Wiley Finance.

Tranmer, Mark & Mark, Elliot. (2010). Multiple Linear Regression, Cathie Marsh Center for Census and Survey Research. [e-book]. Available through: <http://books.google.co.id/books?id=qalLfKNve6sC&lpg=PR1&ots=_KRinUcrZo&dq=credit%20scoring&pg=PA1#v=onepage&q=&f=false> [Accessed 5 February 2010].

Quang, Truong Nhat & Ha, Duong Thu. (2005). New Rules on Debt Classification and Loss Reserve, YKVN lawyers publication, [online]. Available at: <http://www.ykvn-law.com/publications/Decision%20493.v2_eng.pdf> [Accessed 5 February 2010].